
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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DIVISION 08 - DOORS AND WINDOWS

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GLASS AND GLAZING

06/04

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SECTION 08805

GLASS AND GLAZING 06/04

NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers single-glass lights set in metal or wood sash and double-glazing units set in metal sash.

Drawings must indicate the following:

Location of openings to be glazed and sash material

Location of each glass type and nominal thickness

Location of metal sash with face glazing, if required

Location of metal sash with channel glazing, if required

Glass shelving and all-glass doors for wood cabinets are specified in Section 06200 FINISH CARPENTRY.

Glazing beads or stops for glazed openings in doors, frames, and windows are specified in the applicable door or window sections.

Mirrors for washroom equipment and framed mirrors in washrooms and toilets are specified in Section 10800 TOILET AND BATH ACCESSORIES.

Glass and glazing for prefabricated metal buildings are specified in Section 13121 PRE-ENGINEERED BUILDINGS.

PART 1 GENERAL

1.1 REFERENCES

NOTE: The following references should not be manually edited except to add new references. References not used in the text will automatically

be deleted from this section of the project specification.

The publications listed below form a part of this section to the extent referenced:

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 800 (1992) Voluntary Specifications and Test

Methods for Sealants

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z97.1 (1984; R 1994) American National Standards

for Safety Glazing Material Used in Buildings - Safety Performance Specifications and Methods of Test

ASTM INTERNATIONAL (ASTM)

ASTM C 1036 (2001) Standard Specification for Flat

Glass

ASTM C 669 (1995) Standard Specification for Glazing

Compounds for Back Bedding and Face

Glazing of Metal Sash

ASTM C 920 (2002) Standard Specification for

Elastomeric Joint Sealants

FLAT GLASS MARKETING ASSOCIATION (FGMA)

FGMA-01 (2001) Glazing Manual

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-P-00791 (Rev B; Am 2) Putty; Linseed-Oil Type,

(For Wood-Sash-Glazing)

UNDERWRITERS LABORATORIES (UL)

UL Bld Mat Dir (2003) Building Materials Directory

1.2 SUBMITTALS

NOTE: Review submittal description (SD) definitions in Section 01330 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control. Include a columnar list of appropriate products and tests beneath each submittal description.

The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES in sufficient detail to show full compliance with the

specification:

SD-04 Samples

Contractor shall submit the following samples:

Not less than [2] [____] different samples 10 by 12 inches 250 by 300 millimeter of each glass of the specified type, class, thickness, and finish shall be provide for inspection and approval by the Contracting Officer prior to delivery of material to site.

Color samples of each color and type of glazing and sealing compound to be used in the work, beads approximately 1/4-inch wide by 1 inch 6 wide by 25 millimeter long, to illustrate the glazing or sealing compound manufacturer's standard color range after setting or curing.

Clear Glass
Heat Absorbing Glass
Tinted Glass
Safety Rated Tempered Glass
Clear Sheet Glass
Tinted Sheet Glass
Figured Glass
Double Glazing Units
Fire-Rated Wired Glass
Elastic Glazing Compound
Elastomeric Sealing Compound

SD-07 Certificates

Certificates shall be submitted for the following items showing conformance with the referenced standards and tests contained in this section.

Glass Materials Glazing Materials Safety Rated Tempered Glass Fire-Rated Wired Glass

1.3 DELIVERY, STORAGE AND HANDLING

Manufactured glass units shall be delivered and stored until installation in the manufacturer's container's and shall be clearly marked on the exterior as to type, and quantity of units.

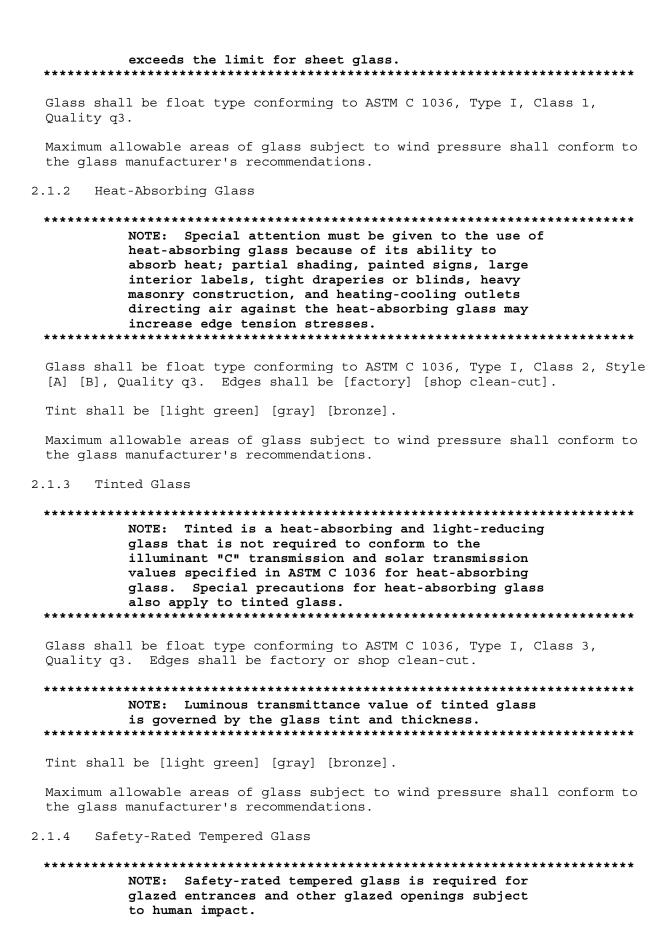
When special moisture protection is required, glass shall be stored in accordance with the manufacturer's recommendations.

PART 2 PRODUCTS

2.1 GLASS MATERIALS

2.1.1 Clear Glass

NOTE: Clear glass is recommended for exterior and interior glazed openings where image distortion would be objectionable or where the glass area



	Glass shall conform to ANSI Z97.1 and shall bear the ANSI safety glass marking.
	Glass before tempering shall be the float type conforming to ASTM C 1036, Type I, Class 1, Quality q3.
	Glass shall be factory-cut to suit each opening. Edges shall be clean cut
2	.1.5 Clear Sheet Glass

	Glass shall conform to ASTM C 1036, Type II, Class 1.
	Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.
	Clear sheet glass shall be double strength.
2	.1.6 Tinted Sheet Glass
	Glass shall conform to ASTM C 1036, Type II, Class 3.
	Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.
	Luminous transmittance value shall be not less than [61] [56] [31] [14] percent.
2	.1.7 Figured Glass

	Glass shall be rolled flat conforming to ASTM C 1036, Type II, Class 1, Form 3, Finish f1, Quality q8. Pattern shall be [].
	Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.
2	.1.8 Fire-Rated Wired Glass

	Glass shall be UL approved for fire windows and doors, shall be listed in the UL Bld Mat Dir, Guide Designation KCMZ, and shall bear the UL listing and marking.

manufacturer. S parallel-strand label is not ava	mesh is availabl quare, rectangula mesh wired glass ilable.	e from only on r, and bearing the UI	ıe
********	*******	*****	******
Polished wire glass shall Mesh m1.	conform to ASTM C	1036, Type II	, Class 1, Form 1,
Figured fire-rated glass sire. Form 2, Mesh m1 or m2. Pa			pe II, Class 1,
2.1.9 Double-Glazing Units			
Units shall be factory fab separated by a hermeticall			flat glass
Maximum allowable areas of the glass manufacturer's r		wind pressure	shall conform to
Clear double-glazing units	shall be as foll	ows:	
instead of $1/4-i$	/2-inch 13 millim nch 6 millimeter nits when require	eter air space for metal-edge	3 3
OUTER PANE GLASS, THICKNESS	INNER PANE GLASS, THICKNESS	AIR SPACE <u>WIDTH</u>	EDGE SEAL
Clear sheet, A quality, double strength	Same as outer pane	3/16 inch	[Glass] []
Clear float 1/8 inch thick	Same as outer pane	1/4 inch	[Glass] []
Clear sheet 3/16 inch thick	Same as outer pane	1/4 inch	[Glass] []
Clear float 1/4 inch thick	Same as outer pane	1/4 inch	[Glass] []
OUTER PANE GLASS, THICKNESS	INNER PANE GLASS, THICKNESS	AIR SPACE WIDTH	EDGE SEAL
Clear sheet, A quality, double strength	Same as outer pane	5 millimeter	[Glass] []
Clear float 3 millimeter thick	Same as outer pane	6 millimeter	[Glass] []

Same as

outer pane

Clear sheet

5 millimeter thick

6 millimeter [Glass] [____]

	OUTER PANE GLASS, THICKNESS Clear float millimeter thick	INNER PANE GLASS, THICKNESS Same as outer pane	AIR SPACE WIDTH 6 millimeter	EDGE SEAL [Glass] []
Tinted	double-glazing units	s shall be as foll	ows:	

	OUTER PANE GLASS, THICKNESS	INNER PANE GLASS, THICKNESS	AIR SPACE <u>WIDTH</u>	EDGE SEAL
	Tinted sheet, luminous trans- mittance value minimum 70 percent, 1/8 inch thick	Same as outer pane	3/16 inch	[Glass] []
	Tinted sheet, luminous trans- mittance value minimum 31 percent, 1/8 inch thick	Clear sheet, A quality, double strength	1/4 inch	[Glass] []
	Tinted sheet, luminous trans- mittance value minimum 61 percent, 3/16 inch thick	Clear sheet, A quality, 3/16 inch thick	1/4 inch	[Glass] []
	Tinted sheet, luminous trans- mittance value minimum 56 percent, 7/32 inch thick	Clear sheet, A quality, 3/16 inch thick	1/4 inch	[Glass] []
	Tinted sheet, luminous trans- mittance value minimum 14 percent, 7/32 inch thick	Clear sheet, A quality, 3/16 inch thick	1/4 inch	[Glass] []
	Tinted light green tint,	Clear float 1/8 inch thick		[Glass] [] inch thick
	Tinted light green tint,	Clear float 1/4 inch thick		[Glass] [] inch thick
	Tinted gray tint, 1/4 inch thick	Clear float, 1/4 inch thick	1/4 inch	[Glass] []
	Tinted bronze tint, 1/4 inch thick	Clear float 1/4 inch thick	1/4 inch	[Glass] []

OUTER PANE GLASS, THICKNESS	INNER PANE GLASS, THICKNESS	AIR SPACE <u>WIDTH</u>	EDGE SEAL	
Tinted sheet, luminous trans- mittance value minimum 70 percent, 3 millimeter thick	Same as outer pane	5 millimeter	[Glass] [_]
Tinted sheet, luminous trans- mittance value minimum 31 percent, 3 millimeter thick	Clear sheet, A quality, double strength	6 millimeter	[Glass] [_]
Tinted sheet, luminous trans- mittance value minimum 61 percent, 5 millimeter thick	Clear sheet, A quality, 5 millimeter thick	6 millimeter	[Glass] [_]
Tinted sheet, luminous trans- mittance value minimum 56 percent, 6 millimeter thick	Clear sheet, A quality, 5 millimeter thick	6 millimeter	[Glass] [_]
Tinted sheet, luminous trans- mittance value minimum 14 percent, 6 millimeter thick	Clear sheet, A quality, 5 millimeter thick	6 millimeter	[Glass] [_]
Tinted light tint, 3 millimeter thick	Clear float 3 millimeter thick	6 millimeter	[Glass] [_]
Tinted light green tint, 6 millimeter thick	Clear float 6 millimeter thick	6 millimeter	[Glass] [_]
Tinted gray tint, 6 millimeter thick	Clear float 6 millimeter thick	6 millimeter	[Glass] [_]
Tinted bronze tint, 6 millimeter thick	Clear float 6 millimeter thick	6 millimeter	[Glass] [_]

2.2 GLAZING MATERIALS

2.2.1 Elastic Glazing Compound

NOTE: Elastic glazing compound is recommended for face glazing or back bedding in steel, aluminum, or other metal sash and is suitable for both exterior and interior exposures. Elastic glazing compound is

not intended for channel or applied stop glazing.
Elastic glazing compound shall conform to ASTM C 669.
Color of the sealing compound shall match the color of the metal sash as closely as possible.

NOTE: The following paragraph describes a product used by Johnson Space Center and must be included in specifications originating at that center.

Unless otherwise specified, elastic glazing compound shall conform to ASTM C 920, Type [S] [] [NS], Class [25] [], and shall be used for glazing-in metal. A glazing compound having a composition and color particularly adapted for aluminum and requiring no painting shall be used for glazing-in aluminum.
.2.2 Thermoplastic Sealing Compound

NOTE: Acrylic solvent-release-curing thermoplastic sealing compound is recommended for clear glass channel or applied stop glazing when the wind pressure does not exceed 30 pounds per square foot 1450 pascal and the glass-light dimensions do not exceed 150 united inches 3810 united millimeter; and when wind pressure does not exceed 45 pounds per square foot 2150 pascal and the glass-light dimensions do not exceed 100 united inches 2540 united millimeter; for heat-absorbing and tinted glass channel or applied stop glazing when the glass-light dimensions do not exceed 100 united inches 2540 united millimeter. Term "united inches" "united millimeter" means the sum of one width and one height of the glass-light or panel, in inches millimeter.
Thermoplastic sealing compound may be used instead of wood-sash putty for channel or applied stop glazing in wood sash.

Compound shall be one-component acrylic terpolymer base conforming to ASTM C 920. Compound shall match the color of the metal sash as closely as possible.
.2.3 Glazing Tape

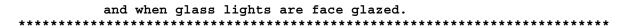
NOTE: Glazing tape is recommended for face glazing in combination with elastic glazing compound when
the glass-light dimensions exceed 50 inches 1250 millimeter or the largest glass dimension exceeds 30

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inches 760 millimeter and for channel glazing or applied stop glazing in combination with sealing compound when the glass-light dimensions exceed 100

******	united inches 2540 united millimeter or the largest glass dimension exceeds 50 inches 1270 millimeter.
	l be nonskinning, nonoily, reinforced class, butyl- or tylene-base resilient preformed compound conforming to AAMA 800.
2.2.4 Ela	astomeric Sealing Compound
*****	******************
*****	NOTE: Elastomeric sealing compound is recommended for clear glass channel or applied stop glazing when the wind pressure exceeds 30 pounds per square foot 1450 pascal and the glass-light dimensions exceed 150 united inches 3810 united millimeter and when the wind pressure exceeds 45 pounds per square foot 2150 pascal and the glass-light dimensions exceed 100 united inches 2540 united millimeter, for heat-absorbing and tinted-glass channel or applied stop glazing when the glass-light dimensions exceed 100 united inches 2540 united millimeter and for all double-glazing unit channel or applied stop glazing. Select one only of the following paragraphs as required by the subject.
*****	*********************
total joi	shall be the two-component, nonsag type, resistant to 50 percent nt movement, conforming to ASTM C 920, Type [S] [] [NS], [] []
total joi	shall be the two-component, nonsag type, resistant to 25 percent nt movement, conforming to ASTM C 920, Type [S] [] [NS], [].
Compound	shall match the color of the metal sash as closely as possible.
	or the compound shall be as recommended by the elastomeric sealing manufacturer.
2.2.5 Woo	od-Sash Putty

Putty sha	ll be the pure linseed oil type conforming to FS TT-P-00791, Type
2.2.6 Sol	vents and Cleaning Agents
	cleaning agents, and other cleaning materials shall be as led by the glazing-material manufacturer.
2.2.7 Gla	azing Clips
******	********************
	NOTE: Glazing clips are required to retain glass lights in metal sash without stops or glazing beads



Clips shall be zinc-coated or copper-clad spring-steel wire or nonferrous metal and shall be the type, sizes, and shapes suitable for the intended use.

2.2.8 Resilient Setting Blocks and Spacers

Blocks shall be solid chloroprene elastomeric extrusions having a Shore A durometer hardness between 70 and 90. Thickness shall be approximately the same as the glass-edge clearance dimension; the length shall be 4 inches 100 millimeter, minimum.

Spacers shall be solid chloroprene elastomeric extrusions having a Shore A durometer hardness between 40 and 50. Spacers shall be 2- to 3-inches 25 to 75 millimeter long with thickness and height to suit the application.

PART 3 EXECUTION

3.1 GENERAL

Glass shall be installed in accordance with the manufacturer's printed instructions.

Field cutting, or nipping or grinding the edges of glass will not be permitted.

Sheet glass shall be installed with the wave horizontal.

Figured glass for exterior openings shall be installed with the smooth side to the exterior.

Operable sash shall move freely and properly in the frame of the unit prior to the start of glazing. Movable items shall be securely fixed or in a closed and locked position until the glazing material has set.

Sizes of glass shown on drawings are approximate. Sizes and proper edge clearances shall be determined by measuring the actual unit to receive glass. Except where specified otherwise, each piece of glass shall bear the manufacturer's label to identify its type as well as thickness and quality. Labels shall not be removed until final approval is obtained.

3.2 TEMPERATURE AND ATMOSPHERIC CONDITIONS

Glazing materials shall not be installed when the ambient temperature is below $40\ 4$ or above $100\ degrees\ F\ 38\ degrees\ C.$

Exterior glazing shall not be performed in damp or rainy weather.

3.3 GLAZED OPENINGS PREPARATION

Surface of rabbets shall be clean and dry prior to the start of glazing.

Surfaces in contact with glazing materials shall be clean and free of loose particles, surface dust, and other foreign matter.

[When elastomeric sealing compound is used, the surfaces shall be cleaned with a solvent that leaves no residue. Surfaces shall be wiped dry before the solvent has air dried.]

3.4 CLEARANCES AND POSITIONING GLASS

Face and edge clearances and positioning glass with setting blocks and spacers shall be as recommended in the FGMA-01.

3.5 APPLICATION OF GLAZING COMPOUNDS

Glazing compounds shall be installed in accordance with the manufacturer's printed instructions and as follows:

[Elastic glazing compound shall be knife-applied as it comes from the container, without adulteration.]

[Thermoplastic sealing compound shall be warmed. Compound shall be gun-applied to fill the cavity without air pockets.]

[Glazing tape shall be compressed slightly to obtain a positive bond and neatly mitered or butted at corners. Backing paper shall be removed prior to installation of the glass.]

[Elastomeric sealing-compound components shall be mixed. Compound shall be gun-applied to fill the cavity without air pockets.]

[Wood-sash putty shall be knife-applied as it comes from the container, without adulteration.]

3.6 SINGLE GLASS IN METAL SASH WITH FACE GLAZING

Single-glass lights up to 50 united inches 1270 united millimeterin size, with the greatest dimension not exceeding 30 inches 760 millimeter, shall be set in metal sash with elastic glazing-compound back bed, heel bead, and front putty.

Single-glass lights between 50 and 100 united inches 1270 and 2540 united millimeter in size, with the greatest dimension between 30 and 50 inches, 760 and 1270 millimeter, shall be set in metal sash with a glazing-tape back bed, an elastic-glazing compound heel bead, and front putty.

Glass lights shall be secured with glazing clips placed at sill, head, and jambs 18 inches 450 millimeter on center, minimum. Each ventilator shall be provided with a minimum of four glazing clips.

Front of each glass light edge in the sash rabbet shall be face-puttied with elastic glazing compound to form a triangular fillet, stopping 1/16 inch 2 millimeter short of the sight line. Corners shall be mitered finish and excess compound shall be removed. Surplus back-bed material shall be stripped at an angle without undercutting.

3.7 SINGLE GLASS IN METAL SASH WITH CHANNEL GLAZING

NOTE: Channel glazing is recommended for single-glass lights exceeding 100 united inches 2540 united millimeter or for single-glass lights having any dimension exceeding 50 inches 1270 millimeter.

Refer to notes in the paragraphs specifying each sealing compound for its recommended uses.

Single-glass lights up to 100 united inches 2540 united millimeterin size shall be set in metal sash with thermoplastic sealing-compound back bed, heel bead, and bedding of stop.

Single-glass lights shall be set in metal sash with glazing-tape back bed, elastomeric sealing-compound heel bead, glazing-tape bedding of stop, and elastomeric sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 1/8-inch 3 millimeterbelow the sight line.

Clear-glass lights between 100 and 150 united inches 2540 and 3810 united millimeter in size shall be set with glazing-tape back bed, thermoplastic sealing-compound heel bead, glazing-tape bedding of stop, and thermoplastic sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 1/8-inch 3 millimeter below the sight line.

Single-glass lights over 100 united inches 2540 united millimetersize shall be set with glazing tape-back bed, elastomeric sealing-compound heel bead, glazing-tape bedding of stop, and elastomeric sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 1/8-inch 3 millimeter below the sight line.

Heat-absorbing glass lights over 100 united inches 2540 united millimeter in size shall be set with glazing-tape back bed, elastomeric sealing-compound heel bead, glazing-tape bedding of stop, and elastomeric sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 1/8-inch 3 millimeter below the sight line.

Tinted-glass lights over 100 united inches 2540 united millimeter in size shall be set with glazing-tape back bed, elastomeric sealing-compound heel bead, glazing-tape bedding of stop, and elastomeric sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept

down at least 1/8-inch 3 millimeter below the sight line.

A void shall be provided at the head and jambs for clear-glass, wired-glass, and figured-glass lights over 100 united inches 2540 united millimeter in size and for all heat-absorbing glass and tinted-glass lights.

Excess sealing compound on the sash shall be removed with a glazing knife at a slight angle over the sight line.

3.8 DOUBLE UNITS IN METAL SASH WITH CHANNEL GLAZING

Double-glazing units shall be set in metal sash with channel glazing in accordance with the recommendations of the FGMA-01.

A void shall be provided at the head and jambs. Excess elastomeric glazing compound on the sash shall be removed with a glazing knife at a slight angle over the sight line.

3.9 SINGLE GLASS IN WOOD SASH WITH CHANNEL GLAZING

Single-glass lights shall be set in wood sash with wood-sash putty or thermoplastic sealing-compound back bed, heel bead, and bedding of stop.

Excess glazing compound or putty shall be removed without undercutting.

3.10 SINGLE GLASS IN ALUMINUM DOORS WITH FLUSH GLAZING

Single-glass lights shall be secured in aluminum doors with the door and frame manufacturer's preformed glazing gaskets and installed in accordance with the manufacturer's printed instructions. Lights shall be positioned with resilient setting blocks as specified.

3.11 GLASS PROTECTION

Glazed openings shall be identified during the construction period by tapes or flags that are not in contact with the glass.

Temporary labels shall be removed immediately after the glass and glazing work has been approved.

3.12 CLEANING

Upon completion of work, glass surfaces shall be cleaned and shall be free of glazing- or sealing-compound, smears, and other defacement.

-- End of Section --